ABSTRACT

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Title of diploma thesis: Radiosensitization of non-small cell lung cancer cell line using autophagy inhibitor Lys05

Nowadays, tumor diseases belong to the world's main causes of death. Research in the area of tumor treatment deals with the development of new methods that improve the health of patients. The aim of my diploma thesis was to find out if the usage of autophagy inhibitors in combination with ionizing radiation (IR) contributed to radiosensitization of non-small cell lung cancer cells H1299. It was based on an assumption that autophagy was a cytoprotective mechanism leading to a cell survival during stress conditions such as IR. In order to examine qualitative changes of H1299 cells pre-treated by the new autophagy inhibitor Lys05 or well known autophagy inhibitor Bafilomycin A1 we used fluorescence microscopy in combination with green staining by LysoSensor green DND-189. The intensity of fluorescence was quantified by flow cytometry. The results have shown that pre-treatment by autophagy inhibitors in combination with IR led to morphological changes of cells and to accumulation of lysosomes within the cells manifested by the increase of fluorescence. In conclusion, Lys05 is a promising substance, which could be used for radiosensitization of H1299 cells.

Keywords: autophagy, radiosensitization, cell line H1299, non-small cell lung cancer, inhibitors of autophagy, Lys05, Bafilomycin A1, LysoSensor Green DND-189, fluorescence microscopy, flow cytometry.